96M4351o

Socket LGA775 Pentium® 4
Intel® Q35 Chipset
PICMG 1.3 SHB Express CPU Card

USER'S MANUAL

Version 1.0

DSM® Computer

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The 96M4351o CPU Card

Introduction

Product Description

The 96M4351o PICMG1.3 board incorporates the Intel® Q35 Express Chipset, consisting of the Intel® Q35 Graphic Memory Controller Hub (GMCH) and Intel® I/O Controller Hub 9 (ICH9), is an optimized integrated graphics solution with a 800/1066/1333 MHz front-side bus.

The integrated graphics engine, based on Intel® Graphics Media Accelerator 3100 (Intel® GMA 3100) architecture, supports Dual Independent Display and delivers richer visual color and picture clarity without the need for additional discrete graphics cards, and the integrated audio support enables premium digital sound and delivers advanced features such as multiple audio.

The CPU card also supports Dual-Channel DDR2 Memory in two DIMM sockets with up to 12.8 GB/s of bandwidth and 4 GB memory addressability for faster system responsiveness and support of 64-bit computing.

The main features of the SBC are:

- Supports Intel Core 2 Duo, Core 2 Quad, and Celeron 400 (Conroe-L) sequence processor
- Two DDR2 667/800 SDRAM DIMM, Max. 4GB
- Onboard Gigabit Ethernet
- Intel® Q35 Express VGA for CRT
- 4x USB 2.0, 2x COM, Watchdog timer, Digital I/O
- 5.1 Ch. Audio
- Optional backplane with 2x PCI-E(x4), 1x PCI-E (x16), 8x PCI slots, 2x ISA slots, 4x USB connectors

Dimensions of the board are 338mm x 126mm.

Checklist

Your 96M4351o Pentium® 4 CPU card package should include the items listed below:

- The 96M4351o CPU card
- This User's manual
- 1 Floppy cable
- 1 IDE cable
- 1 USB cable with bracket (USB2K-4)
- 1 Y-Cable supporting a PS/2 Keyboard and a PS/2 Mouse
- 1 SATA cable
- 2 Serial Port Ribbon Cable and 1 Parallel Port Attached to a Mounting Bracket
- 1 Audio cable with bracket (Audio-18K)
- Optional backplane
- 1 CD containing the following:
  - Chipset Drivers
  - Flash Memory Utility

***Reminder**:*
SATA:

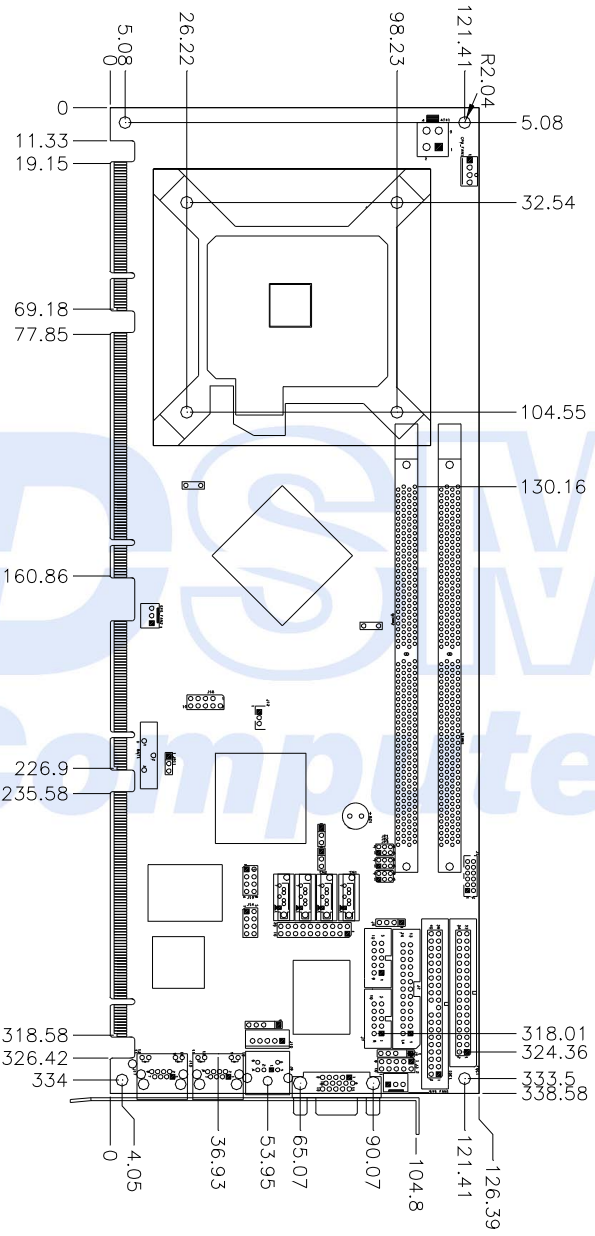
When using the legacy operating system, only one controller is available and the ports supported are SATA port 0, 1 (CN1, CN2).

It is suggested that the operating system is installed using these SATA ports.

Specifications

Product Name	96M4351o
Form Factor	PICMG 1.3 SHB Express full size CPU card
CPU Support	Socket LGA775, Supports the Intel Core 2 Duo and Intel Core2 Quad processors, and Intel Celeron 400 (Conroe-L) Sequence processor.
CPU Voltage	0.5V~1.6V (VRD 11.0)
System Speed	Up to 3.8GHz+
CPU FSB	800MHz/1066MHz/1333MHz
Green /APM	APM1.2
CPU Socket	LGA 775
Chipset	Intel® Bearlake Chipset Q35 + ICH9R
BIOS	Award BIOS; supports ACPI
VGA	Q35 built-in, supports CRT
LAN1	Intel 82566DM PCI Express Gigabit PHY
LAN2	Intel 82574L PCI Express Gigabit controller
Memory type	Support Dual Channel DDR2 DIMM Module x 2, 667/800MHz (Without ECC function), Max. 4GB
LPC I/O	W83627EHG: IrDA x1, Parallel x1, COM1 (RS232), COM2 (RS232/422/485), FDCx1, Hardware monitoring
RTC/CMOS	Built in ICH9/ICH9R
Battery	Lithium battery
Keyboard/Mouse	Supports PS/2 Keyboard/Mouse connector
IDE	ITE IT8211 PCI to PATA controller for one PATA channel support
SATA II	Intel ICH9 built-in SATA II controller (3.0Gb/sec) w/ 4 ports
Edge Connector	DB15 x1 for VGA PS/2 Connector x1 for keyboard/mouse RJ-45 x2 for Gigabit LAN
Onboard Header/Connector	40 pins box-header x1 for IDE1 34 pins box-header x1 for Floppy 26 pins box-header x1 for LPT 10 pins box-header x2 for COM1/2 8 (4x2) pins header x 2 for USB1~4 5 pins header x 1 for IrDA(cut pin2) 12 pins header x1 for audio Line-Out, Line-In & Microphone 4 pins header x1 for built-in speaker SATA connector x4 for 4 SATA ports
Watchdog Timer	Yes (256 segments, 0, 1, 2… 255 sec/min)
Digital I/O	4 In / 4 Out
System Voltage	+5V, +3.3V, +12V, 5VSB (2A)
Other	Modem Wakeup, LAN Wakeup
Board Size	338mm x 126mm
Golden Finger I/F (Also Backplane Spec.)	PCI w/ 4x PCI master (Supports 4 PCI Slots) 4x (x1 PCIe slots) 1x (x16 PCIe slot) 4x USB2.0 ports

Board Dimensions



Installations

This section provides information on how to use the jumpers and connectors on the 96M4351o in order to set up a workable system.
The topics covered are:

Installing the CPU 6
Installing the Memory 7
Setting the Jumpers 8
Connectors on 96M4351o 12

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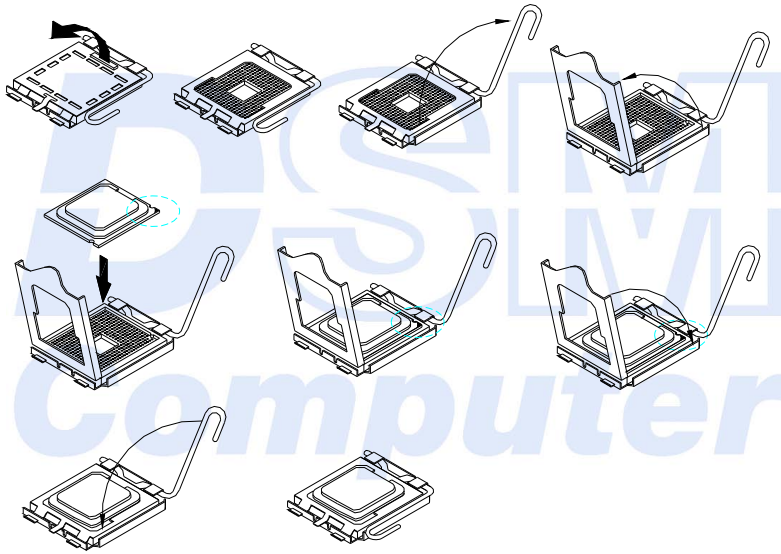
Installing the CPU

The 96M4351o supports an LGA 775 processor socket for Intel Core 2 Duo and Intel Core2 Quad processors, and Intel Celeron 400(Conroe-L) Sequence processor.

The LGA 775 processor socket comes with a lever to secure the processor. Refer to the pictures below, from left to right, on how to place the processor into the CPU socket. ***Please note that the cover of the LGA775 socket must always be installed during transport to avoid damage to the socket.***



Installing the Memory

The 96M4351o supports two DDR2 memory sockets for a maximum total memory of 4GB in DDR2 memory type. It supports DDR2 667/800.

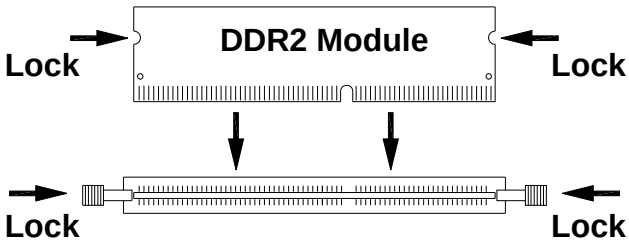
Basically, the system memory interface has the following features:

- Supports two 64-bit wide DDR data channels
- Available bandwidth up to 6.4GB/s (DDR2 800) for single-channel mode and 12.8GB/s (DDR2 800) in dual-channel mode.
- Supports 256Mb, 512Mb, 1Gb DDR2 technologies.
- Supports only x8, x16, DDR2 devices with four banks
- Supports only unbuffered DIMMs
- Supports opportunistic refresh
- Up to 32 simultaneously open pages (four per row, four rows maximum)

Installing and Removing Memory Modules

To install the DDR2 modules, locate the memory slot on the board and perform the following steps:

1. Hold the DDR2 module so that the key of the DDR2 module align with those on the memory slot.
2. Gently push the DDR2 module in an upright position until the clips of the slot close to hold the DDR2 module in place when the DDR module touches the bottom of the slot.
3. To remove the DDR2 module, press the clips with both hands.



Setting the Jumpers

Jumpers are used on 96M4351o to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on 96M4351o and their respective functions.

Jumper Locations on 96M4351o 9
JP1, JP2, JP3: RS232/422/485 (COM2) Selection 10
JP4: Configure and Recovery (Factory use only) 10
JP5: Power ON Setting 10
JP7: ICH9 PCI-E port 1-4 Configuration Settings 11
JP11: Clear CMOS Contents 11

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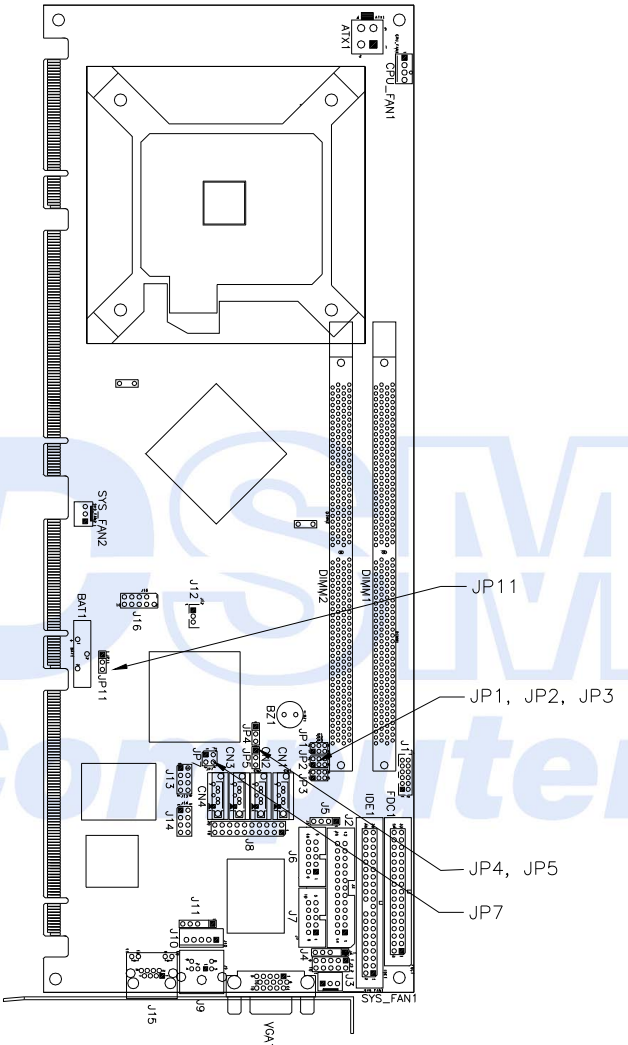
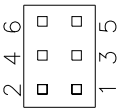
Jumper Locations on 96M4351o



Jumpers on 96M4351o.....Page
JP1, JP2, JP3: RS232/422/485 (COM2) Selection 10
JP4: Configure and Recovery (Factory use only)..... 10
JP5: Power ON Setting..... 10
JP7: ICH9 PCI-E port 1-4 Configuration Settings 11
JP11: Clear CMOS Contents..... 11

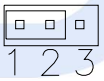
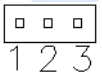
JP1, JP2, JP3: RS232/422/485 (COM2) Selection

COM1 is fixed for RS-232 use only.
COM2 is selectable for RS232, RS-422 and RS-485.
The following table describes the jumper settings for COM2 selection.

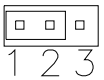
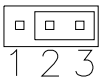


COM2 Function	RS-232	RS-422	RS-485
Jumper Setting (pin closed)	JP1: 1-2 JP2: 3-5 & 4-6 JP3: 3-5 & 4-6	JP1: 3-4 JP2: 1-3 & 2-4 JP3: 1-3 & 2-4	JP1: 5-6 JP2: 1-3 & 2-4 JP3: 1-3 & 2-4

JP4: Configure and Recovery (Factory use only)

JP9	Setting	Function
	Pin 1-2 Short/Closed	Normal (default)
	Pin 2-3 Short/Closed	Configure
	Open	Recovery

JP5: Power ON Setting

JP17	Setting	Function
	Pin 1-2 Short/Closed	Power on by system button
	Pin 2-3 Short/Closed	Power on by power supply AC on

JP7: ICH9 PCI-E port 1-4 Configuration Settings

JP7 Setting	Function
Pin 1-2 & 3-4 Short	ICH9 PCI-E port 1-4 setting as 1x PCI-E x4
Pin 1/2/3/4 Open	ICH9 PCI-E port 1-4 setting as 4x PCI-E x1

JP11: Clear CMOS Contents

Use JP11 to clear the CMOS contents. *Note that the ATX-power connector should be disconnected from the board before clearing CMOS.*

JP11	Setting	Function
	Pin 1-2 Short/Closed	Normal
	Pin 2-3 Short/Closed	Clear CMOS

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Connectors on 96M4351o

The connectors on 96M4351o allow you to connect external devices such as keyboard, mouse, hard disk drives, printers… etc. The following table lists the connectors on 96M4351o and their respective functions.

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CPU_FAN1: CPU Fan Power Connector 14
SYS_FAN1, SYS_FAN2: SYSTEM Fan Power Connector 14
CN1, CN2, CN3, CN4: SATA HDD Connector 14
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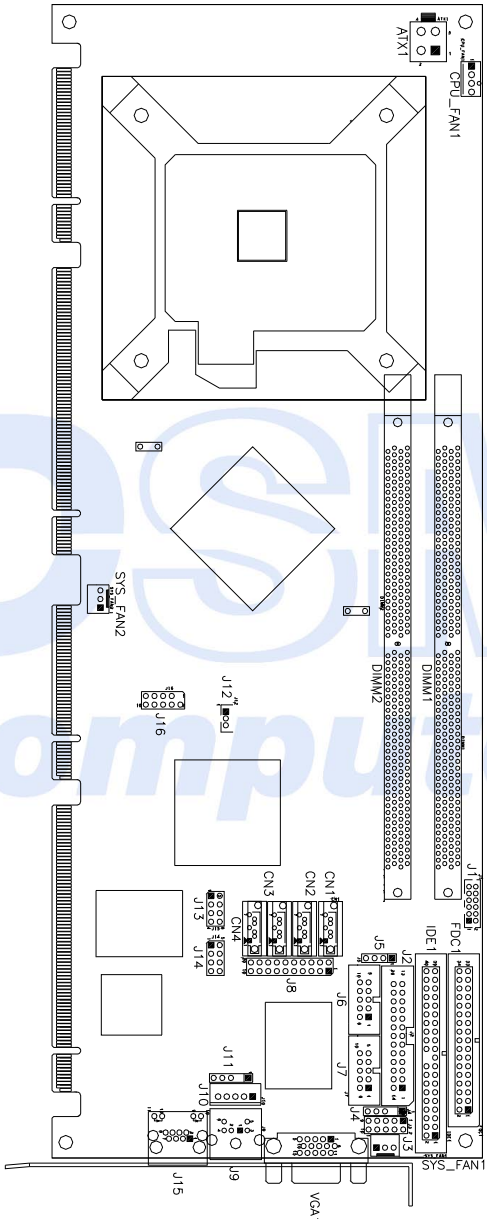
J14: USB Connector 21
J15, J17: Gigabit LAN RJ45 Connector 21
J16: SPI Debug Tools Port (Factory use only) 21

Connector Locations on 96M4351o



ATX1: ATX 12V Power Connector
DIMM1: Channel A DDR2 Socket
DIMM2: Channel B DDR2 Socket
CPU_FAN1: CPU Fan Power Connector
SYS_FAN1, SYS_FAN2: System Fan Power
CN1, CN2, CN3, CN4: SATA HDD Connector
IDE1: Primary IDE Connectors
FDC1: Floppy Drive Connector
VGA1: VGA CRT Connector
J1: External Audio Connector
J2: Parallel Port Connector
J3: Digital I/O Connector (4 in, 4 out)
J4: IrDA Connector
J5: CD-In Audio Connector
J6: COM2 Serial Port
J7: COM1 Serial Ports Connector
J8: System Function Connector
J9: PS/2 Keyboard and Mouse Connector
J10, J11: External PS/2 MS/KB Connector
J12: Wake On LAN Connector
J13: USB Connector
J14: USB Connector
J15, J17: Gigabit LAN RJ45 Connector
J16: SPI Debug Tools Port
(Factory use only)

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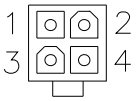
ATX1: ATX 12V Power Connector



Pin #	Signal Name
1	Ground
2	Ground
3	+12V
4	+12V

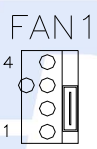
DIMM1: Channel A DDR2 Socket

DIMM1is the first-channel DDR2 sockets.

DIMM2: Channel B DDR2 Socket

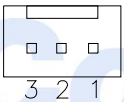
DIMM2 is the second-channel DDR2 sockets.

CPU_FAN1: CPU Fan Power Connector



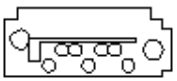
Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection
4	Control

SYS_FAN1, SYS_FAN2: SYSTEM Fan Power Connector



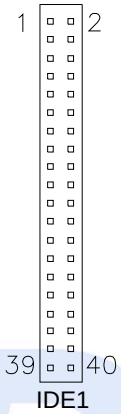
Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

CN1, CN2, CN3, CN4: SATA HDD Connector



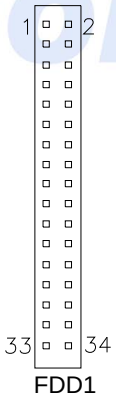
Pin #	Signal Name
1	Ground
2	TX+
3	TX-
4	Ground
5	RX-
6	RX+
7	Ground

IDE1: Primary IDE Connector



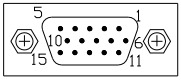
Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Protect pin
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

FDC1: Floppy Drive Connector



Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	RM/LC
Ground	3	4	No connect
Ground	5	6	No connect
Ground	7	8	Index
Ground	9	10	Motor enable 0
Ground	11	12	Drive select 1
Ground	13	14	Drive select 0
Ground	15	16	Motor enable 1
Ground	17	18	Direction
Ground	19	20	Step
Ground	21	22	Write data
Ground	23	24	Write gate
Ground	25	26	Track 00
Ground	27	28	Write protect
Ground	29	30	Read data
Ground	31	32	Side 1 select
Ground	33	34	Diskette change

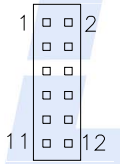
VGA1: VGA CRT Connector



Signal Name	Pin #	Pin #	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
VCC	9	10	GND
N.C.	11	12	DDCDATA
HSYNC	13	14	VSYNC
DDCCLK	15		

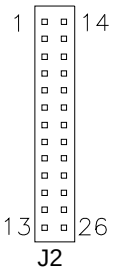
J1: External Audio Connector

J1 is a 12-pin header that is used to connect to the optional audio cable that integrates jacks for Line In, Line Out and Mic.



Signal Name	Pin #	Pin #	Signal Name
LINEOUT R	1	2	LINEOUT L
Ground	3	4	Ground
LINEIN R	5	6	LINEIN L
Ground	7	8	Ground
Mic-In	9	10	VREF-Mic
Ground	11	12	Protect pin

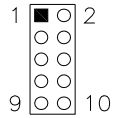
J2: Parallel Port Connector



Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	N/A	N/A

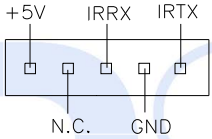
J3: Digital I/O Connector (4 in, 4 out)

This 10-pin digital I/O connector supports TTL levels and is used to control external devices requiring ON/OFF circuitry.



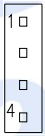
Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	+5V
Out3	3	4	Out1
Out2	5	6	Out0
IN3	7	8	IN1
IN2	9	10	IN0

J4: IrDA Connector



Pin #	Signal Name
1	+5V
2	No connect
3	Ir RX
4	Ground
5	Ir TX

J5: CD-In Audio Connector

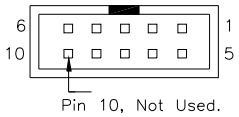


Pin #	Signal Name
1	CD Audio R
2	Ground
3	Ground
4	CD Audio L

J6: COM2 Serial Port

COM2 is jumper selectable for RS-232, RS-422 and RS-485.

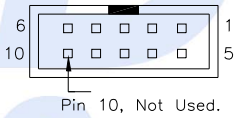
Please refer to JP1, JP2, JP3: RS232/422/485 (COM2) Selection



Pin #	Signal Name		
	RS-232	R2-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	RTS-	NC
7	RTS	RTS+	NC
8	CTS	CTS+	NC
9	RI	CTS-	NC
10	NC	NC	NC

J7: COM1 Serial Ports Connector

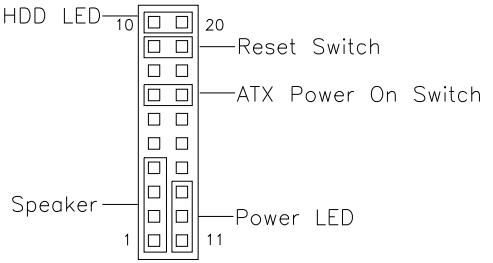
J7 is a 10-pin header support RS232 COM ports.



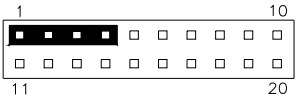
Signal Name	Pin	Pin	Signal Name
DCD	1	6	DSR
RX	2	7	RTS
TX	3	8	CTS
DTR	4	9	RI
GND	5	10	NC

J8: System Function Connector

J8 provides connectors for system indicators that provide light indication of the computer activities and switches to change the computer status.



Speaker: Pins 1 - 4
This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.

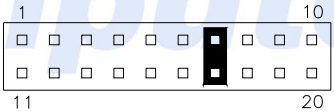


Pin #	Signal Name
1	Speaker out
2	No connect
3	Ground
4	+5V

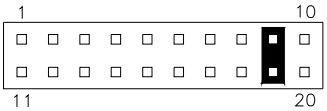
Power LED: Pins 11 - 13
The power LED indicates the status of the main power switch.

Pin #	Signal Name
11	Power LED
12	No connect
13	Ground

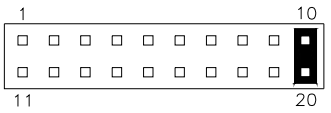
ATX Power ON Switch: Pins 7 and 17
This 2-pin connector is an "ATX Power Supply On/Off Switch" on the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.



Reset Switch: Pins 9 and 19
The reset switch allows the user to reset the system without turning the main power switch off and then on again. Orientation is not required when making a connection to this header.



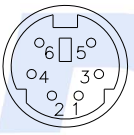
Hard Disk Drive LED Connector: Pins 10 and 20
This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.



Pin #	Signal Name
10	HDD Active
20	5V

J9: PS/2 Keyboard and Mouse Connector

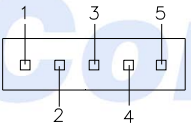
J9 uses a Y-cable with dual D-connectors for a PS/2 keyboard and a PS/2 mouse.



J9

Pin #	Signal Name
1	Keyboard data
2	Mouse data
3	Ground
4	Vcc
5	Keyboard Clock
6	Mouse Clock

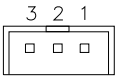
J10, J11: External PS/2 Mouse and Keyboard Connector



Pin #	J10	J11
1	KB clock	Mouse data
2	KB data	N.C.
3	N.C.	Ground
4	Ground	Vcc
5	Vcc	Mouse clock

J12: Wake On LAN Connector

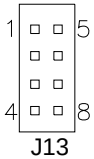
J12 is a 3-pin header for the Wake On LAN function on the motherboard. The following table shows the pin out assignments of this connector. Wake On LAN will function properly only with an ATX power supply with 5VSB that has 1A.



Pin #	Signal Name
1	+5VSB
2	Ground
3	LAN Wakeup

J13: USB Connector

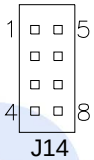
The following table shows the pin outs of the USB pin header.



Signal Name	Pin	Pin	Signal Name
Vcc	1	5	Ground
USB0-	2	6	USB1+
USB0+	3	7	USB1-
Ground	4	8	Vcc

J14: USB Connector

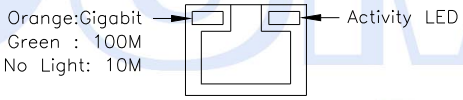
The following table shows the pin outs of the USB pin header.



Signal Name	Pin	Pin	Signal Name
Vcc	1	5	Ground
USB2-	2	6	USB3+
USB2+	3	7	USB3-
Ground	4	8	Vcc

J15, J17: Gigabit LAN RJ45 Connector

J15, J17 are Gigabit LAN RJ45 connectors.



J16: SPI Debug Tools Port (Factory use only)

DSM Computer®

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DSM® Computer

BIOS Setup

This chapter describes the different settings available in the Award BIOS that comes with the board. The topics covered in this chapter are as follows:

BIOS Introduction 24
BIOS Setup 24
Standard CMOS Setup 26
Advanced BIOS Features 29
Advanced Chipset Features 32
Power Management Setup 38
PNP/PCI Configurations 41
PC Health Status 42
Frequency/Voltage Control 43
Load Fail-Safe Defaults 44
Load Optimized Defaults 44
Set Supervisor Password 44
Save & Exit Setup 44
Exit Without Saving 44

DSM® Computer

BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power on Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system off and back on again. The following message will appear on the screen:

```
Press  <DEL>  to  Enter  Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Phoenix - AwardBIOS CMOS Setup Utility

Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	
Time, Date, Hard Disk Type…	

The section below the setup items of the Main Menu displays the control keys for this menu. At the bottom of the Main Menu just below the control keys section, there is another section, which displays information on the currently highlighted item in the list.

***Note**: If the system cannot boot after making and saving system changes with Setup, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

***Warning:** It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Standard CMOS Setup

"Standard CMOS Setup" choice allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the motherboard is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Wed, Oct 3, 2007	Item Help
Time (hh:mm:ss)	16 : 11 : 00	Menu Level >
IDE Channel 0 Master	None	Change the day, month,
IDE Channel 0 Slave	None	Year and century
IDE Channel 1 Master	None	
IDE Channel 1 Slave	None	
Drive A	1.44M, 3.5 in.	
Drive B	None	
Video	EGA/VGA	
Halt On	All , But Keyboard	
Base Memory	640K	
Extended Memory	2086912K	
Total Memory	2087936K	

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

Date

The date format is:

Day : **Sun to Sat**
Month : **1 to 12**
Date : **1 to 31**
Year : **1999 to 2099**

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

Time

The time format is: **Hour : 00 to 23**
Minute : 00 to 59
Second : 00 to 59

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

IDE Channel Master/Slave

The onboard Serial ATA connectors provide Primary and Secondary channels for connecting up to four Serial ATA hard disks . Each channel can support up to two hard disks; the first is the "Master" and the second is the "Slave".

Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select 'Manual' to define the drive information manually. You will be asked to enter the following items.

Capacity :	Capacity/size of the hard disk drive
Cylinder :	Number of cylinders
Head :	Number of read/write heads
Precomp :	Write precompensation
Landing Zone :	Landing zone
Sector :	Number of sectors

The Access Mode selections are as follows:

CHS	(HD < 528MB)
LBA	(HD > 528MB and supports Logical Block Addressing)
Large	(for MS-DOS only)
Auto	

Drive A / Drive B

These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

360KB	1.2MB	720KB	1.44MB	2.88MB
5.25 in.	5.25 in.	3.5 in.	3.5 in.	3.5 in.

Video

This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

Halt On

This field determines whether or not the system will halt if an error is detected during power up.

No errors	The system boot will not be halted for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a keyboard or disk error; it will stop for all others.

DFWI® Computer

Advanced BIOS Features

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

CPU Feature	Press Enter	ITEM HELP
Hark Disk Boot Priority	Press Enter	Menu Level >
Virus Warming	Disabled	
CPU L3 Cache	Enabled	
Quick Power On Self Test	Enabled	
First Boot Device	CDROM	
Second Boot Device	Legacy LAN	
Third Boot Device	Hard Disk	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Disabled	
Boot Up NumLock Status	On	
Gate A20 Option	Fast	
Typematic Rate Setting	Disabled	
Typematic Rate (Chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	Setup	
APIC Mode	Enabled	
MPS Version Control for OS	1.4	
OS Select For DRAM>64MB	Non-OS2	
Report No FDD For WIN 95	No	
Small Logo (EPA) Show	Disabled	

CPU Feature

Press Enter to configure the settings relevant to CPU Feature.

Hard Disk Boot Priority

Press Enter to configure the settings.

Virus Warming

If this option is enabled, an alarm message will be displayed when trying to write on the boot sector or on the partition table on the disk, which is typical of the virus.

CPU L3 Cache

Cache memory is additional memory much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. By default, these items are enabled.

Quick Power On Self Test

When enabled, this field speeds up the Power On Self Test (POST) after the system is turned on. If it is set to *Enabled*, BIOS will skip some items.

First/Second/Third Boot Device
These fields determine the drive that the system searches first for an operating system.

Boot Other Device
These fields allow the system to search for an OS from other devices other than the ones selected in the First/Second/Third Boot Device.

Swap Floppy Drive
This item allows you to determine whether or not to enable Swap Floppy Drive. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to ***Disabled.***

Boot Up Floppy Seek
This feature controls whether the BIOS checks for a floppy drive while booting up. If it cannot detect one (either due to improper configuration or its absence), it will flash an error message.

Boot Up NumLock Status
This allows you to activate the NumLock function after you power up the system.

Gate A20 Option
This field allows you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB.

Typematic Rate Setting
When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to ***Disabled.***

Typematic Rate (Chars/Sec)
When the typematic rate is enabled, the system registers repeated keystrokes speeds. Settings are from 6 to 30 characters per second.

Typematic Delay (Msec)
When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to ***250msec.***

Security Option

This field allows you to limit access to the System and Setup. The default value is ***Setup***. When you select *System*, the system prompts for the User Password every time you boot up. When you select *Setup*, the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

APIC Mode

APIC stands for Advanced Programmable Interrupt Controller. The default setting is ***Enabled***.

MPS Version Control for OS

This option is specifies the MPS (Multiprocessor Specification) version for your operating system. MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability. The default setting is ***1.4***.

OS Select for DRAM > 64MB

This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is ***Non-OS/2***.

Report No FDD For WIN 95

If you are using Windows 95/98 without a floppy disk drive, select Enabled to release IRQ6. This is required to pass Windows 95/98's SCT test. You should also disable the Onboard FDC Controller in the Integrated Peripherals screen when there's no floppy drive in the system. If you set this feature to Disabled, the BIOS will not report the missing floppy drive to Win95/98.

Small Logo (EPA) Show

The EPA logo appears at the right side of the monitor screen when the system is boot up. The default setting is ***Disabled***.

Advanced Chipset Features

This Setup menu controls the configuration of the chipset.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

		ITEM HELP
DRAM Timing Selectable	By SPD	Menu Level >
CAS Latency Time	Auto	
DRAM RAS# to CAS# Delay	Auto	
DRAM RAS# Precharge	Auto	
Precharge dealy (tRAS)	Auto	
System Memory Frequency	By SPD	
System BIOS Cacheable	Enabled	
Memory Hole at 15M-16M	Disabled	
PCI Express Root Port Func	Press Enter	
** VGA Setting **		
PEG/On Chip VGA Control	Auto	
On-Chip Frame Buffer Size	8MB	
DVMT Mode	DVMT	
DVMT/FIXED memory Size	128MB	
SDVO Device Setting	None	
SDVO LVDS Protocol	1 Ch 18bit	
SDVO Panel Number	852 x 480	
Boot Display	Auto	
Panel Scaling	Auto	
Panel Number	1024 x 768 18bit SC	
Onboard Lan Boot ROM	Enabled	
Onboard IT8211F IDE ROM	Enabled	

DRAM Timing Selectable

This option refers to the method by which the DRAM timing is selected. The default is ***By SPD***.

CAS Latency Time

You can select CAS latency time in HCLKs of 3/3 or 4/4. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU. The choices are 3, 4 and 5.

DRAM RAS# to CAS# Delay

This option allows you to insert a delay between the RAS (Row Address Strobe) and CAS (Column Address Strobe) signals. This delay occurs when the SDRAM is written to, read from or refreshed. Reducing the delay improves the performance of the SDRAM.

DRAM RAS# Precharge

This option sets the number of cycles required for the RAS to accumulate its charge before the SDRAM refreshes.

Precharge delay (tRAS)
The default setting for the Active to Precharge Delay is Auto.

System Memory Frequency
This field sets the frequency of the DRAM memory installed. The default setting is *Auto*. The other settings are *DDR667* and *DDR800*.

System BIOS Cacheable
The setting of *Enabled* allows caching of the system BIOS ROM at F000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Memory Hole At 15M-16M
In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB. The choices are *Enabled* and *Disabled*.

PCI Express Root Port Func
Press Enter to configure this field.

VGA Setting
The fields under the On-Chip VGA Setting and their default settings are:

PEG/On Chip VGA Control: Auto
On-Chip Frame Buffer Size: 8MB
DVMT Mode: DVMT
DVMT/Fixed Memory Size: 128MB
SDVO Device Setting: None

To use the single DVI setting, install the IBP192-R DVI module; to use the dual DVI setting, install the IBP192D-R DVI module; and to use the LVDS+TV or LVDS or TV-out setting, install the IBP190 module.

SDVO LVDS Protocol: 1Ch 18bit
SDVO Panel Number: 852 x 480
Boot Display: Auto
Panel Scaling: Auto
Panel Number: 1024 x 768 18bit SC
Onboard Lan Boot ROM: Enabled
Onboard IT8211F IDE ROM: Enabled

Integrated Peripherals

This section sets configurations for your hard disk and other integrated peripherals. The first screen shows three main items for user to select. Once an item selected, a submenu appears. Details follow.

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

OnChip IDE Device	Press Enter	ITEM HELP
SuperIO Device	Press Enter	Menu Level >
USB Device Setting	Press Enter	

Phoenix - AwardBIOS CMOS Setup Utility
OnChip IDE Device

IDE HDD Block Mode	Enabled	ITEM HELP
IDE DMA transfer access	Enabled	
IDE Primary Master PIO	Auto	Menu Level >
IDE Primary Slave PIO	Auto	
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
On-Chip Secondary PCI IDE	Enabled	
IDE Secondary Master PIO	Auto	
IDE Secondary Slave PIO	Auto	
IDE Secondary Master UDMA	Auto	
IDE Secondary Slave UDMA	Auto	
SATA Mode	IDE	
LEGACY Mode Support	Enabled	

Phoenix - AwardBIOS CMOS Setup Utility
Onboard Device

POWER ON Function	BUTTON ONLY	ITEM HELP
KB Power ON Password	Enter	
Hot Key power ON	Ctrl-F1	
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	3F8/IRQ4	Menu Level >
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
RxD , TxD Active	Hi, Lo	
IR Transmission Delay	Enabled	
UR2 Duplex Mode	Half	
Use IR Pins	IR-Rx2Tx2	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	SPP	
EPP Mode Select	EPP1.7	
ECP Mode Use DMA	3	
PWRON After PWR-Fail	Off	

Phoenix - AwardBIOS CMOS Setup Utility
USB Device Setting

USB 1.0 Controller	Enabled	ITEM HELP
USB 2.0 Controller	Enabled	Menu Level >
USB Keyboard Function	Disabled	
USB Mouse Function	Disabled	
USB Storage Function	Enabled	
*** USB Mass Storage Device Boot Setting ***		

IDE HDD Block Mode
This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

IDE DMA Transfer Access
This field, by default, is enabled

OnChip Secondary PCI IDE
This field, by default, is enabled

IDE Primary/Secondary Master/Slave PIO
These fields allow your system hard disk controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.

The system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

IDE Primary/Secondary Master/Slave UDMA
These fields allow your system to improve disk I/O throughput to 33Mb/sec with the Ultra DMA/33 feature. The options are *Auto* and *Disabled*.

SATA Mode
The setting choices for the SATA Mode are IDE, RAID and AHCI Mode. Select [IDE] if you want to have SATA function as IDE.
Select [AHCI] for Advanced Host Controller Interface (AHCI) feature, with improved SATA performance with native command queuing & native hot plug. Select [RAID] to use SATA as RAID function. RAID function is supported on the board if it uses ***ICH9R, but this is optional.***

LEGACY Mode Support
When the Serial ATA (SATA) is set with the legacy mode enabled, then the SATA is set to the conventional IDE mode. Legacy mode is otherwise known as compatible mode.

Power ON Function
This field is related to how the system is powered on – such as with the use of conventional power button, keyboard or hot keys. The default is ***BUTTON ONLY***.

KB Power ON Password
This field allows users to set the password when keyboard power on is the mode of the Power ON function.

Hot Key Power ON
This field sets certain keys, also known as hot keys, on the keyboard that can be used as a 'switch' to power on the system.

Onboard FDC Controller
Select *Enabled* if your system has a floppy disk controller (FDC) installed on the motherboard and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field. This option allows you to select the onboard FDD port.

Onboard Parallel/Serial Port
These fields allow you to select the onboard serial and parallel ports and their addresses. The default values for these ports are:

Serial Port 1	3F8/IRQ4
Serial Port 2	2F8/IRQ3
Parallel Port	378H/IRQ7

UART Mode Select
This field determines the UART 2 mode in your computer. The default value is ***Normal***.

Parallel Port Mode

This field allows you to determine parallel port mode function.

SPP	Standard Printer Port
EPP	Enhanced Parallel Port
ECP	Extended Capabilities Port
ECP+EPP	Combination of ECP and EPP capabilities
Normal	Normal function

PWRON After PWR-Fail

This field sets the system power status whether *on or off* when power returns to the system from a power failure situation.

USB 1.0 Controller

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Enabled***.

USB 2.0 Controller

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Enabled***. In order to use USB 2.0, necessary OS drivers must be installed first. ***Please update your system to Windows 2000 SP4 or Windows XP SP1.***

USB Keyboard Support

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Disabled***.

USB Mouse Support

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Disabled***.

USB Storage Function

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Disabled***.

Power Management Setup

The Power Management Setup allows you to save energy of your system effectively.

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

		ITEM HELP
ACPI Function	Enabled	
ACPI Suspend Type	S3(STR)	
Power Management	User Define	Menu Level >
Video Off Method	DPMS	
Video Off In Suspend	Yes	
Suspend Type	Stop Grant	
Modem Use IRQ	3	
Suspend Mode	Disabled	
HDD Power Down	Disabled	
Soft-Off by PWR-BTTN	Instant-Off	
CPU THRM-Throttling	50%	
Wake-Up by PCI Card	Disabled	
Power On by Ring	Disabled	
USB KB Wake-up From S3	Disabled	
Resume by Alarm	Disabled	
Date (of Month) Alarm	0	
Time (hh:mm:ss) Alarm	0 : 0 : 0	
** Reload Global Timer Events **		
Primary IDE 0	Disabled	
Primary IDE 1	Disabled	
Secondary IDE 0	Disabled	
Secondary IDE 1	Disabled	
FDD, COM, LPT Port	Disabled	
PCI PIRQ[A-D] #	Disabled	
HPET Support	Enabled	
HPET Mode	32-bit mode	

ACPI Function

Enable this function to support ACPI (Advance Configuration and Power Interface).

ACPI Suspend

The default setting of the ACPI Suspend mode is ***S3(STR)***.

Power Management

This field allows you to select the type of power saving management modes. There are four selections for Power Management.

Min. Power Saving	Minimum power management
Max. Power Saving	Maximum power management.
User Define	Each of the ranges is from 1 min. to 1hr. Except for HDD Power Down which ranges from 1 min. to 15 min.

Video Off Method

This field defines the Video Off features. There are three options.

V/H SYNC + Blank	Default setting, blank the screen and turn off vertical and horizontal scanning.
DPMS	Allows BIOS to control the video display.
Blank Screen	Writes blanks to the video buffer.

Video Off In Suspend

When enabled, the video is off in suspend mode. The default setting is ***Yes***.

Suspend Type

The default setting for the Suspend Type field is ***Stop Grant***.

Modem Use IRQ

This field sets the IRQ used by the Modem. By default, the setting is ***3***.

Suspend Mode

When enabled, and after the set time of system inactivity, all devices except the CPU will be shut off.

HDD Power Down

When enabled, and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

Soft-Off by PWR-BTTN

This field defines the power-off mode when using an ATX power supply. The *Instant Off* mode allows powering off immediately upon pressing the power button. In the *Delay 4 Sec* mode, the system powers off when the power button is pressed for more than four seconds or enters the suspend mode when pressed for less than 4 seconds.

CPU THRM-Throttling

When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.

Wake up by PCI Card

By default, this field is disabled.

Power On by Ring
This field enables or disables the power on of the system through the modem connected to the serial port or LAN.

Resume by Alarm
This field enables or disables the resumption of the system operation. When enabled, the user is allowed to set the *Date* and *Time*.

Reload Global Timer Events
The HDD, FDD, COM, LPT Ports, and PCI PIRQ are I/O events that can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

DSM® Computer

PNP/PCI Configurations

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

PNP OS Installed	No	
Init Display First	PCI Slot	ITEM HELP
Reset Configuration Data	Disabled	
		Menu Level >
Resources Controlled By	Auto (ESCD)	
IRQ Resources DMA Resources	Press Enter Press Enter	
PCI/VGA Palette Snoop	Disabled	
PCI Express relative items		
Maximum Payload Size	128	

PNP OS Installed

Enable the PNP OS Install option if it is supported by the operating system installed. The default value is *No.*

Init Display First

The default setting is ***PCI Card***.

Reset Configuration Data

This field allows you to determine whether to reset the configuration data or not. The default value is ***Disabled.***

Resources Controlled by

This PnP BIOS can configure all of the boot and compatible devices automatically with the use of a use a PnP operating system such as Windows 95.

PCI/VGA Palette Snoop

Some non-standard VGA display cards may not show colors properly. This field allows you to set whether or not MPEG ISA/VESA VGA cards can work with PCI/VGA. When this field is enabled, a PCI/VGA can work with an MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with an MPEG ISA/VESA card.

Maximum Payload Size

The default setting of the PCI Express Maximum Payload Size is 128.

PC Health Status

This section shows the parameters in determining the PC Health Status. These parameters include temperatures, fan speeds and voltages.

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status

		ITEM HELP
Shutdown Temperature	Disabled	
CPU Warning Temperature	Disabled	Menu Level >
Current System Temp.	34°C/93°F	
Current CPU1 Temperature	27°C/80°F	
Current CPU2 Temperature	0°C/32°F	
FAN1 Speed	0 RPM	
FAN2 Speed	4400 RPM	
FAN3 Speed	0 RPM	
Vcore(V)	1.02 V	
VIN0	1.32 V	
VIN1	3.32 V	
VIN3	4.94 V	
3.3V	3.32 V	
VBAT(V)	3.08 V	
5VSB(V)	4.96 V	
Smart Fan Temperature	Disabled	
Fan Tolerance Value	4	

Shutdown Temperature

This field allows the user to set the temperature by which the system automatically shuts down once the threshold temperature is reached. This function can help prevent damage to the system that is caused by overheating.

CPU Warning Temperature

This field allows the user to set the temperature so that when the temperature is reached, the system sounds a warning. This function can help prevent damage to the system that is caused by overheating.

Temperatures/Fan Speeds/Voltages

These fields are the parameters of the hardware monitoring function feature of the board. The values are read-only values as monitored by the system and show the PC health status.

Smart Fan Temperature

This field enables or disables the smart fan feature. At a certain temperature, the fan starts turning. Once the temperature drops to a certain level, it stops turning again.

Frequency/Voltage Control

This section shows the user how to configure the processor frequency.

Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control

CPU Clock Ratio	8 X	ITEM HELP
Auto Detect PCI Clk	Disabled	
Spread Spectrum	Disabled	Menu Level >

Auto Detect PCI Clk

This field enables or disables the auto detection of the PCI clock.

Spread Spectrum

This field sets the value of the spread spectrum. The default setting is ***Disabled***. This field is for CE testing use only.

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Load Fail-Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

Load Optimized Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

Set Supervisor Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

Save & Exit Setup

This option allows you to determine whether or not to accept the modifications. If you type “Y”, you will quit the setup utility and save all changes into the CMOS memory. If you type “N”, you will return to Setup utility.

Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing “Y” will quit the Setup utility without saving the modifications. Typing “N” will return you to Setup utility.

Drivers Installation

This section describes the installation procedures for software and drivers under the Windows 98SE, Windows ME, Windows 2000 and Windows XP. The software and drivers are included with the motherboard. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

Intel Chipset Software Intallation Utility.....46
Intel Graphics Driver Installation 48
Realtek HD Code Audio Driver Installation.....49
Intel PRO LAN Drivers Installation 50
IDE Controller Driver Installation……..52

IMPORTANT NOTE:

1. After installing your Windows operating system(Windows 98SE/ME/2000/XP), you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

2. How to create an AHCI driver disk, when your board supports the RAID/AHC function:
   1. Put an empty disc into your floppy disk drive
   2. Execute the f6flpy32.exe that is in the Driver CD you have received. The path is 8.1D\Intel\Q35\Raid\

3.When IDE Device (HDD, CDROM, etc.) is to be used, one must use a USB-FDD device (with the IDE device driver floppy diskette inserted) to install the drivers when Windows is initializing. When Windows is starting, press F6 and follow the proceeding instructions. The IDE device drivers can be found in the driver DVD disc that is provided with the motherboard with location in E:\SCSI\ITE8211\DISK\ (assuming E: is the DVD ROM drive).

Intel Chipset Software Intallation Utility

The Intel Chipset Drivers should be installed first before the software drivers to enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation under Windows 98SE/ME/2000/XP. (Before installed Intel Chipset Software Installation Utility,Please update your system to Windows 2000 SP4 or Windows XP SP1A)

1. Insert the CD that comes with the board. Click ***Intel Chipsets*** and then ***Intel(R) Bearlake Chipset Family Drivers***.

2. Click ***Intel(R) Chipset Software Installation Utility.***

3. When the Welcome screen appears, click ***Next*** to continue.

4. Click ***Yes*** to accept the software license agreement and proceed with the installation process.

5. On the Readme Information screen, click ***Next*** to continue the installation.

6. When the Setup Progress screen appears, click ***Next*** to continue.

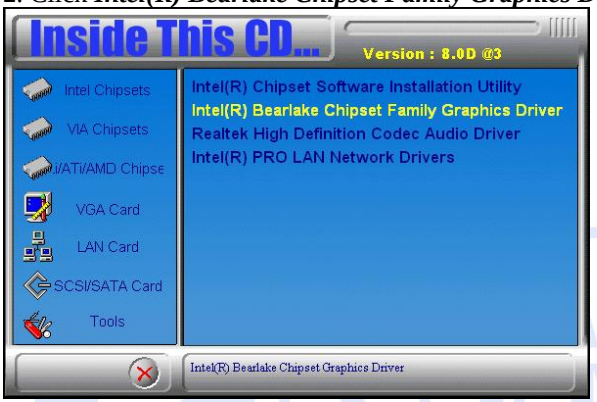
7. The Setup process is now complete. Click ***Finish*** then restart the computer and for changes to take effect.

Intel Graphics Driver Installation

To install the Graphics drivers, follow the steps below to proceed with the installation.

1. Insert the DVD that comes with the board. Click ***Intel Chipsets*** and then ***Intel(R) Bearlake Chipset Family Drivers***.

2. Click ***Intel(R) Bearlake Chipset Family Graphics Driver.***



3. When the Welcome screen appears, click ***Next*** to continue.

4. Click ***Yes*** to accept the software license agreement and proceed with the installation process.

5. On Readme File Information screen, click ***Next*** to continue.

6. On Setup Progress screen, click ***Next*** to continue the installation.

7. The Setup process is now complete. Click ***Finish*** to restart the computer and for changes to take effect.

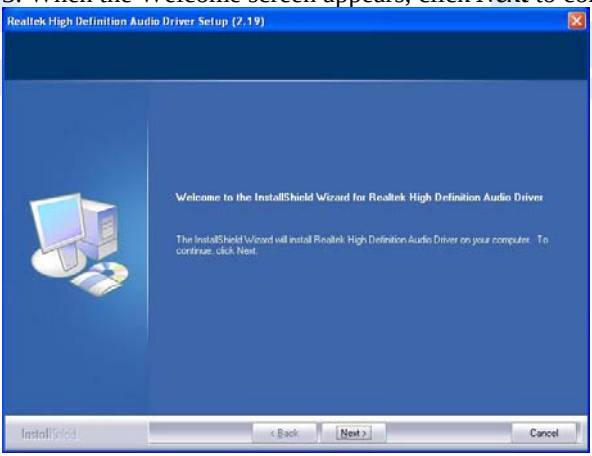
Realtek HD Code Audio Driver Installation

Follow the steps below to install the Realtek High Definition Codec Audio Driver.

1. Insert the DVD that comes with the board. Click ***Intel Chipsets*** and then ***Intel(R) Bearlake Chipset Family Drivers***.

2. Click ***Realtek High Definition Codec Audio Driver.***

3. When the Welcome screen appears, click ***Next*** to continue.



4. The Setup process is now complete. Restart the computer when prompted for changes to take effect.

Intel PRO LAN Drivers Installation

Follow the steps below to start installing the Intel 82566DM or Intel 82574L drivers.

1. Insert the DVD that comes with the board. Click ***Intel Chipsets*** and then ***Intel(R) Bearlake Chipset Family Drivers***.

2. Click ***Intel(R) PRO LAN Network Drivers.***

3. On the next screen, click ***Install Drivers*** to start the drivers installation.

4. When the Welcome screen appears, click ***Next*** to continue.

5. In the License Agreement screen, click ***I accept the terms in license agreement*** and ***Next*** to accept the software license agreement and proceed with the installation process.

6. When the Setup Options appears, click ***Install Drivers only*** and ***Next*** to continue.

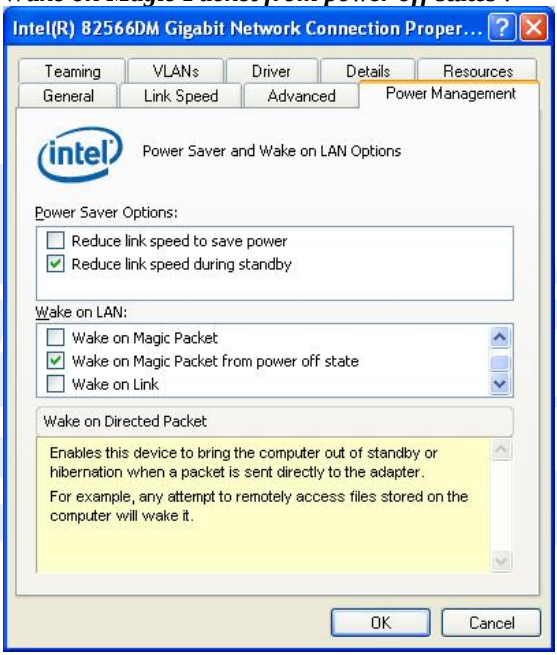
7. When the Ready to Install the Program screen appears, click ***Install*** to continue.

8. The Setup process is now complete (InstallShield Wizard Completed). Click ***Finish*** to restart the computer and for changes to take effect.

Follow the steps below to use the wake up function by Intel 82566DM or Intel 82574L.

1. The BIOS Setup item “Wake-Up by PCI card” has to be set as [Enabled] .

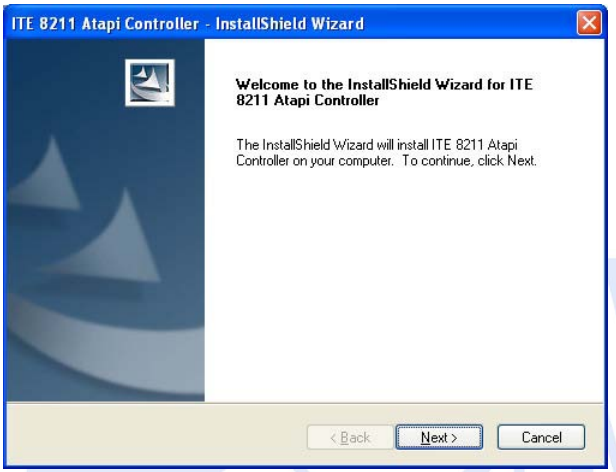
2. Go to the Device Manager under Windows and select Network adapters. The following window will appear (Intel(R) 82566DM Gigabit Network Connection Properties). Click ***Power Management*** and select ***Wake on Magic Packet from power off states*** .



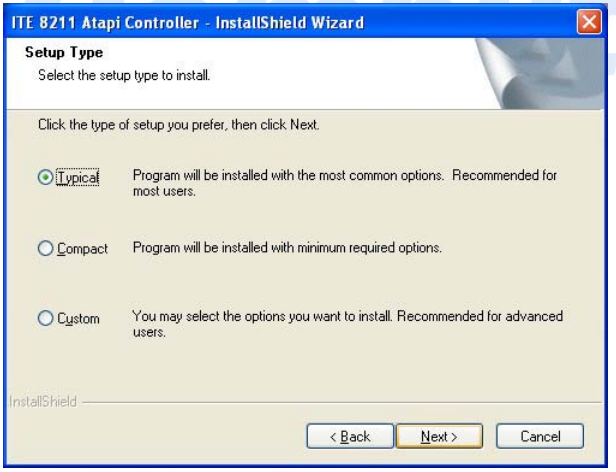
3. Turn off computer .

IDE Controller Drivers Installation

Follow the steps below to install IDE Controller Drivers.
1. Insert the CD that comes with the motherboard. Click ***ITE8211 Chip*** and then ***IDE Controller Drivers*** . When the Welcome screen appears, click ***Next*** to continue.



2. Select Type as 'Typical' and click ***Next*** to continue. Restart when promoted and finish the installation process.



Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE

ESM® Computer

C. Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sort of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE:
This code and information is provided "as is" without warranty of any kind, either expressed or implied, including but not limited to the implied warranties of merchantability and/or fitness for a particular purpose.

```
;[]=============================================
; Name  : Enable_And_Set_Watchdog
; IN    : AL - 1sec ~ 255sec
; OUT   : None
;[]=============================================
Enable_And_Set_Watchdog   Proc    Near
        push    ax              ;save time interval
        call Unlock_Chip

        mov cl, 2Bh
        call Read_Reg
        and al, NOT 10h
        call Write_Reg          ;set GP24 as WDTO

        mov cl, 07h
        mov al, 08h
        call Write_Reg          ;switch to LD8
```

```
        mov cl, 0F5h
        call Read_Reg
        and al, NOT 08h
        call Write_Reg          ;set count mode as second

        pop ax
        mov cl, 0F6h
        call Write_Reg          ;set watchdog timer

        mov al, 01h
        mov cl, 30h
        call Write_Reg          ;watchdog enabled

        call Lock_Chip
        ret
Enable_And_Set_Watchdog   Endp
;[]=============================================
; Name  : Disable_Watchdog
; IN    : None
; OUT   : None
;[]=============================================
Disable_Watchdog    Proc    Near
        call Unlock_Chip

        mov cl, 07h
        mov al, 08h
        call Write_Reg          ;switch to LD8

        xor  al, al
        mov cl, 0F6h
        call Write_Reg          ;clear watchdog timer

        xor  al, al
        mov cl, 30h
        call Write_Reg          ;watchdog disabled

        call Lock_Chip
        ret
Disable_Watchdog    Endp
;[]=============================================
```

```
; Name  : Unlock_Chip
; IN : None
; OUT   : None
;[]=============================================
Unlock_Chip     Proc    Near
        Mov dx, 4Eh
        mov al, 87h
        out  dx, al
        out  dx, al
        ret
Unlock_Chip     Endp
;[]=============================================
; Name  : Lock_Chip
; IN : None
; OUT   : None
;[]=============================================
Unlock_Chip     Proc    Near
        mov dx, 4Eh
        mov al, 0AAh
        out  dx, al
        ret
Unlock_Chip     Endp
;[]=============================================
; Name  : Write_Reg
; IN : CL - register index
;      AL - Value to write
; OUT   : None
;[]=============================================
Write_Reg   Proc    Near
        push    ax
        mov dx, 4Eh
        mov al,cl
        out  dx,al
        pop ax
        inc  dx
        out  dx,al
        ret
Write_Reg   Endp
;[]=============================================
```

```
; Name   : Read_Reg
; IN : CL - register index
; OUT    : AL - Value to read
;[]================================================
==
Read_Reg     Proc       Near
             Mov al, cl
             mov dx, 4Eh
             out  dx, al
             inc  dx
             in    al, dx
             ret
Read_Reg     Endp
;[]================================================
```

DSM® Computer

D. Digital I/O Sample Code

Filename: W627hf.h

```
//====================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//====================================================================
#ifndef __W627HF_H
#define __W627HF_H                      1
//====================================================================
#define W627_IOBASE                     0x4E
//====================================================================
#define     W627HF_INDEX_PORT       (W627_IOBASE+0)
#define     W627HF_DATA_PORT        (W627_IOBASE+1)
//====================================================================
#define     W627HF_REG_LD           0x07
//====================================================================
#define W627HF_UNLOCK               0x87
#define     W627HF_LOCK             0xAA
//====================================================================
void Set_W627HF_LD( unsigned char);
void Set_W627HF_Reg( unsigned char, unsigned char);
unsigned char Get_W627HF_Reg( unsigned char);
//====================================================================
#endif      //__W627HF_H
```

DSM Computer

Filename: W627hf.cpp

```
//===========================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//===========================================================================
#include "W627HF.H"
#include <dos.h>
//===========================================================================
void Unlock_W627HF (void);
void Lock_W627HF (void);
//===========================================================================
void Unlock_W627HF (void)
{
        outportb(W627HF_INDEX_PORT, W627HF_UNLOCK);
        outportb(W627HF_INDEX_PORT, W627HF_UNLOCK);
}
//===========================================================================
void Lock_W627HF (void)
{
        outportb(W627HF_INDEX_PORT, W627HF_LOCK);
}
//===========================================================================
void Set_W627HF_LD( unsigned char LD)
{
        Unlock_W627HF();
        outportb(W627HF_INDEX_PORT, W627HF_REG_LD);
        outportb(W627HF_DATA_PORT, LD);
        Lock_W627HF();
}
//===========================================================================
void Set_W627HF_Reg( unsigned char REG, unsigned char DATA)
{
        Unlock_W627HF();
        outportb(W627HF_INDEX_PORT, REG);
        outportb(W627HF_DATA_PORT, DATA);
        Lock_W627HF();
}
//===========================================================================
unsigned char Get_W627HF_Reg( unsigned char REG)
{
        unsigned char Result;
        Unlock_W627HF();
        outportb(W627HF_INDEX_PORT, REG);
        Result = inportb(W627HF_DATA_PORT);
        Lock_W627HF();
        return Result;
}
//===========================================================================
```

File of the Main.cpp

ASUSTeK Computer

```
//=============================================================================
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//=============================================================================
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "W627HF.H"
//=============================================================================
void ClrKbBuf(void);
int main (int argc, char *argv[]);
//=============================================================================
int main (int argc, char *argv[])
{
	unsigned char ucDO = 0;				//data for digital output
	unsigned char ucDI;				//data for digital input
	unsigned char ucBuf;

	Set_W627HF_LD( 0x07);				//switch to logic device 7

	Set_W627HF_Reg(0xF1, 0x00);			//clear
	ucDI = Get_W627HF_Reg(0xF1) & 0x0F;

	ClrKbBuf();
	while(1)
	{
		ucDO++;
		Set_W627HF_Reg(0xF1, ((ucDO & 0x0F) << 4));
		ucBuf = Get_W627HF_Reg(0xF1) & 0x0F;
		if (ucBuf != ucDI)
		{
			ucDI = ucBuf;
			printf("Digital I/O Input Changed. Current Data is 0x%X\n",ucDI);
		}

		if (kbhit())
		{
			getch();
			break;
		}
		delay(500);
	}
	return 0;
}
//=============================================================================
void ClrKbBuf(void)
{
	while(kbhit())
	{	getch();	}
}
//-----------------------------------------------------------------------------
```

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